What is claimed is:

1. A packet classification apparatus using a field level tries structure, said apparatus comprising:

a main processing part for generating and maintaining the field level tries structure, which organizes a multi-field packet by field in a hierarchical structure for classifications; and

a plurality of classification engines, each classification engine provided with a first classification part for performing queries and updates and processing a prefix lookup represented by an IP address lookup, and a second classification part for proceeding with packet classification by field based on a result of the first classification part in order to process a range lookup belonging to the result.

2. The packet classification apparatus as claimed in claim 1, wherein each classification engine includes a classification processor and a memory.

3. The packet classification apparatus as claimed in claim 2, wherein the main processing part and the classification engines are connected through a broadcasting bus.

4. The packet classification apparatus as claimed in claim 1, wherein the first classification part of each classification engine stores fields

of a prefix format and uses a ternary content addressable memory (TCAM) to search the stored fields.

5. The packet classification apparatus as claimed in claim 1, wherein the second classification part uses a k-way search scheme having an appropriate value k based on usage and specification.

6. The packet classification apparatus as claimed in claim 5, wherein the value k is determined based on a size of a memory interface of the second classification part.

7. The packet classification apparatus as claimed in claim 3, wherein the main processing part sends an update instruction to the classification engines through the broadcasting bus, and each classification engine instructs a change of contents of a memory of the classification engine upon receipt of the update instructions.

8. The packet classification apparatus as claimed in claim 1, wherein the field level tries structure is organized as a structure wherein one or more fields of a first group appear in an upper level of the structure and one or more fields of a second group appear in a lower level of the structure.

9. The packet classification apparatus as claimed in claim 8, wherein the fields of the first group are fields in a prefix format.

10. The packet classification apparatus as claimed in claim 8, wherein the fields of the second group are fields in a range format.

11. The packet classification apparatus as claimed in claim 1, wherein if two nodes in any level have a common child node, only one node, corresponding to the common child node, is generated and shared in the field level tries structure.

12. The packet classification apparatus as claimed in claim 1, wherein in the field level tries structure, a level for the prefix lookup exists as only one level having a plurality of prefixes combined with each other.

13. A packet classification apparatus using a field level tries structure, said apparatus comprising:

means for generating and maintaining the field level tries structure, which organizes a multi-field packet by field in a hierarchical structure for classifications;

means for performing queries and updates and processing a prefix lookup represented by an IP address lookup; and

means for proceeding with packet classification by field based on a result of the prefix lookup in order to process a range lookup based on the result.

14. A packet classification method for a routing system, comprising:

forming field level tries for classifying multi-field packets;

processing a prefix lookup with respect to a plurality of packet classification rules by using the field level tries; and

processing a range lookup after the prefix lookup process.

15. The packet classification method as claimed in claim 14, wherein the field level tries are organized in a structure wherein one or more fields of a first group appear in an upper level of the structure and one or more fields of a second group appear in a lower level of the structure.

16. The packet classification method as claimed in claim 14, wherein if two nodes in any level have a common child node, only one node, corresponding to the common child node, is generated and shared in the field level tries.

17. The packet classification method as claimed in claim 14, wherein in the field level tries, a level for the prefix lookup exists as only one level having a plurality of prefixes combined with each other.